Powering Next-level CX with Digital Twins

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Nearly 55 years ago, the Apollo 13 mission experienced a near-catastrophic failure on its way to the moon as an explosion in the oxygen tanks damaged the engines and left remaining oxygen levels critically low. This led to the now infamous saying, "Houston, we have a problem." The "problem" was wildly complex, and neither NASA nor the astronauts knew for certain exactly what had happened. To complicate matters more, it encapsulated a life-or-death crisis involving equipment, people, and systems — which were now located over two thousand miles away from Earth. To bring the astronauts safely home, NASA relied on what is now being deemed [the world's first digital twin](#).

NASA had developed 15 training simulators for Apollo 11 and 13 missions that incorporated physical elements such as the crew, cockpit, mission-control console, with "make believe" situations created by computers, formulas, and technicians to replicate various issues that might occur. What made the Apollo 13 case unique, however, was that NASA mission controllers were able to adapt these simulations to replicate the exact scenario that was occurring in real life to identify a viable solution. This was arguably the world's first digital twin, which [NASA now defines as](#) "a digital replica of a living or non-living physical entity…to gain insight into present and future operational states of each physical twin."

The concept of simulations and [digital twins wasn't entirely new at the time and has been gaining ground ever since](#). First getting traction in Computer Aided Design and Manufacturing (CAD/CAM) in the early '80s, then the concept being minted by Dr. Michael Grieves at the Society of ManufacturingEngineers conference in 2022, rapidly accelerating with the advent of the Internet of Things (IoT) and Industry 4.0, and eventually finding its way into the everyday life in the consumer market as well. But if there were any doubt of the significance of digital twins, you can still ask astronauts Fred Haise and Jim Lovell, who are alive today and in their 90s, as a direct result. Today, digital twins are becoming a mainstay across many industries, and that includes helping telecom service providers improve their customer experience (CX).

Boosting CX with AI & Digital Twins

Customers are both unique and complex. Like the Apollo 13 mission, they involve equipment, people, and a distance that can span thousands of miles — with the life or death of a business being held in the balance. This is a scenario perfectly suited for AI and digital twins.

Software providers like Etiya are now using AI and digital twins to solve customer pain points for Communication Service Providers (CSPs), and to take customer experience to the next level. *Pipeline* recently interviewed key stakeholders at Etiya to get their take on how their AI-driven Digital BSS and integrated digital twin models are being used to improve customer satisfaction by providing hyper-personalized offers and stellar customer care.

Etiya's Digital Business Platforms includes a comprehensive set of products and tools, including acquisition and retention in CRM, advanced bundling capabilities in product catalog management, accurate quoting and fulfillment with CPQ and order management, and a smart, automated customer service management system to support omnichannel digital experiences. With integrated AI capabilities, these products work together on harmonizing CX operations across the whole organization so that CSPs can better understand and communicate with their customers and personalize their experience to build valuable long-term relationships.

CX-focused Telco Operation

The heart of any business is the customers that pump the lifeblood of revenue throughout the organization. And like the heart, customers and their requirements are complex and understanding them can be challenging. Each customer encompasses a unique set of cultural considerations, devices, financial factors, personal habits, preferences, services, and more. This complexity increases exponentially as companies scale to serve more business and residential customers.

In today's competitive and constantly evolving market, telecom operators need to focus on protecting revenues and profits, but even in a challenging market environment customer experience cannot fall victim to cost-cutting efforts. While communication services are becoming increasingly commoditized, customer experience has become the primary competitive differentiator between service providers. Ultimately, customer experience and satisfaction determine whether customers stay with the brand or switch providers.

Customers increasingly depend on mobile services such as voice, data, internet, and entertainment services in their daily lives. For an optimal experience, their customer journey should be smooth and free from any technical issues or errors that can occur during the set-up or billing processes, the adoption of new devices, over-the-top applications and bundles, and those that can be caused by network connectivity problems. Etiya refers to the "hygiene factor" where all services must work flawlessly and seamlessly all the time through real-time monitoring of the network, services, usage, and automated proactive remediation of issues before they impact customers.

Leveraging Artificial Intelligence (AI) for network and billing anomaly detection and complaint prediction allows CSPs to monitor, identify, and remedy potential service interruptions or invoicing errors before they impact customers. This approach proactively prevents the costs of service outages, customer complaint management, and the cost of customer acquisition as a result of customers who churn due to a poor
service experience. In addition to this, customers should feel valued and understood by their service provider through every interaction they have with them. This means operators need to be able to provide customers with offers that are highly personalized to their unique needs and usage habits. It

also means providing a greater degree of flexibility, control, and personalized services within customer care channels. A Digital BSS with integrated AI capabilities can help operators meet both customer expectations.

Etiya's AI-driven Digital BSS helps service providers and enterprises transform their customer experience by providing a deep understanding of the customer and service factors — and the relationships between them — and creating virtual simulations they can use for scenario modeling. This enables them to test and predict customer acceptance without the risk of lost business and revenues. Etiya's [Digital Twin of Customer (DTOC) approach](#) empowers telecom operators to take their customer experience to the next level with hyper-personalized offers, recommendations, and virtual agents that provide support in the process.

Highly tailored, predictive retention helps telecom operators reduce churn and decrease costs associated with new customer acquisition to replace lost revenue. When operators compete on customer experience, and not on price, this also maintains healthier margins while increasing revenues with better service uptake, allowing them to invest more in innovations that will ultimately bolster customer satisfaction.

Using AI and Digital Twins to Optimize CX

Digital twins allow operators to create a predictive model of their customers, including their behavior, habits, and usage patterns. The digital twin can then be integrated into service providers' BSS environments for customer experience management, segmentation and targeting, demand and resource forecasting, predictive maintenance, cost optimization, simulation, risk management, and process optimization.

AI is a broad term with a wide variety of use cases, and perfectly suited for improving the customer experience, including supporting digital twin modelling. For example, Etiya's Digital Twin engine — built on [Etiya's Artificial Intelligence Platform, Cognitus](#) — enables digital twins to be modeled, monitored, analyzed, and continuously updated with new data. Etiya's Digital Twin engine becomes a "living entity" and new modelling can be performed at any time with fresh data. This allows operators to stay current with constantly evolving customer requirements and needs.

Through AI and ML technologies, Etiya's Digital Twin model uses deep customer insights to create hyper-personalized recommendations. These highly relevant offers can be based on similar users, basket content, or relevant sales points. Offers can also be created for "similar," "trending" or promoted items, cross-sell and upsell opportunities, and discount packages. This ensures better service adoption through more relevant offers to similar customers.

Digital twins can also be used by operators as a testing ground to improve offers and processes by providing high-value analytical insights before introducing them to customers. In addition, these insights can be combined with different scenarios and experiments to virtually design different desired outcomes.

Digital Twin technology can also empower a seamless customer care and customer self-service experience. Relevant customer recommendations become a seamless part of the customer journey. For example, customers will see offers tailored to their specific needs and usage habits and provide the best value for them in their web self-service portal.

In addition, an LLM-based virtual assistant can also be used to support sales and customer service agents to provide tailored offers, and allows them to experiment with bundles and dynamic pricing. In a guided configuration process CSRs can find the most suitable offer that provides the best value, for

both the customer and the operator. The algorithm also predicts the uptake by customers and projects the potential revenue that such offers could generate. This provides operators with a greater degree of certainty, putting them back in control of their growth.

Business Outcomes with Next-level CX

In an increasingly competitive telecom landscape, CX has become one of the defining factors for success. By integrating AI and Digital Twin technologies into Digital BSS, operators can change the way they engage with customers, transforming customer care from a cost center into a powerful growth enabler.

Next-level CX with personalized and proactive service delivery provides a seamless, smart, and immersive customer journey, driving higher satisfaction and retention, while predictive insights reduce churn and foster loyalty. Tailored upselling opportunities and innovative pricing strategies unlock revenue growth and help operators in achieving sustainable profitability. Moreover, it places the customer at the heart of operations — where they rightly belong — and this commitment to providing an exceptional customer experience elevates brand reputation.

Telecom customers are complex, and it takes sophisticated technology, such as AI and digital twins, to enable automation, visibility, and control of the customer journey to take CX to the next level. To thrive in this dynamic market, telecom operators must embrace these transformative tools and place CX at the heart of their strategic priorities. Innovators such as Etiya provide powerful Digital BSS Platforms with integrated digital twin and Artificial Intelligence (AI) technology to help CSPs gain deep customer insights and create highly personalized offers. This gives operators the ability to dynamically experiment with offer creation to increase campaign success rates, enhance customer satisfaction and chart their own course to maximize growth.